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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/523,329	03/10/2000	Timothy M Schmidl	TI-29503	5461

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EXAMINER

PHUNKULH, BOB A

ART UNIT	PAPER NUMBER
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2661

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/523,329

Applicant(s)

SCHMIDL ET AL.

Examiner

Bob A. Phunkulh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20 and 46-53 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-12, 21-45, 54-59 and 62 is/are rejected.
- 7) ☒ Claim(s) 6, 60-61 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This communication is in response to applicant's 06/01/2004 amendment(s)/response(s) in the application of **SCHMIDL et al.** for "**SYSTEM AND METHOD OF COMMUNICATION USING TRANSMIT ANTENNA DIVERSITY BASED UPON UPLINK MEASUREMENT FOR THE TDD MODE OF WCDMA**" filed 03/10/2000. The amendments/response to the claims have been entered. No claims have been canceled. No claims have been added. Claims 1-62 are now pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 12, 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley, III (US ,5437,055), hereinafter Wheatley, in view of Akerberg (US 6,483,826).

Regarding claims 1 and 2, Wheatley disclose a method of communicating data between a base station having a plurality of antennas and at least one mobile terminal, the method comprising the steps of

transmitting from the base station, derived versions of a signal to each antenna within the plurality of antennas (see figure 2, and col. 6 lines 18-48); and

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providing a distinct delay associated with each derived version of the midamble signal and its respective antenna (see col. 6 lines 49-63 and figure 2).

Wheatley fails to explicitly disclose the signal is midamble signal.

Akerberg, on the other hand, discloses communicating data between a base station and at least one mobile terminal using midamble signal (see col. 8 lines 62).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to including Akergerg's teaching in the system taught by Wheatley especially including midamble signal when communication between the base station and the mobile station for the receiver i.e. mobile station to derive slot and bit synchronization.

Regarding claim 3, wherein at least one derived version of the signal is formed by scaling the amplitude of the signal (see figure 2 and col. 4 lines 22-29).

Regarding claim 4, wherein at least one derived version of the signal is formed by shifting the phase of the signal (see figure 2 and col. 4 lines 22-29).

Regarding claim 5, wherein at least one derived version of the signal is formed by scaling the amplitude and shifting the phase of the signal (see figure 2 and col. 4 lines 22-29).

Regarding claim 12, Wheatley discloses each time division duplex communication signal is associated with a code division multiple access data signal (see col. 6 lines 38-48).

Regarding claims 35 and 36, Wheatley discloses a data communication system comprising:

a base station having a plurality of spaced apart antennas (see figure 2, and col. 6 lines 18-63);

means for transmitting from the base station, derived versions of a signal to each antenna within the plurality of spaced apart antennas (see figure 2, and col. 6 lines 18-63); and

means for providing a distinct delay associated with each derived version of the signal and its respective antenna within the plurality of spaced apart antennas (the plurality of delay elements 16A-16(N-1), see figure 2, and col. 6 lines 18-63).

Wheatley fails to explicitly disclose the signal is midamble signal.

Akerberg, on the other hand, discloses communicating data between a base station and at least one mobile terminal using midamble signal (see col. 8 lines 62).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to including Akerberg's teaching in the system taught by Wheatley especially including midamble signal when communication between the base station and the mobile station for the receiver i.e. mobile station to derive slot and bit synchronization.

Regarding claim 37, wherein at least one derived version of the signal is formed by shifting the phase of the signal (see figure 2 and col. 4 lines 22-29).

Regarding claim 38, wherein at least one derived version of the signal is formed by scaling the amplitude and shifting the phase of the signal (see figure 2 and col. 4 lines 22-29).

Regarding claim 39, Wheatley discloses each time division duplex communication signal is associated with a code division multiple access data signal (see col. 6 lines 38-48).

Claims 21, 27-28, 34, 54, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wheatley in view of Juntti (US 5,564,074).

Regarding claim 21, Wheatley discloses a data communication system comprising:

a base station having a plurality of spaced apart antennas (see figure 2 and col. 6 lines 18-37);

signal distribution means for coupling communication signals between the base station and the plurality of spaced apart antennas (the combination of modulator 28 and T/R filter 32, see figure 2);

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and means for providing a distinct delay associated with each antenna of the plurality of spaced apart antennas such that a communication signal coupled between the base station and the plurality of spaced apart antennas can be demodulated within the at least one mobile terminal (the base station comprising of a plurality of delay elements 16A-16(N-1) to provides time diversity between nodes, see figure 2 and col. 6 lines 49-51).

Wheatley fails to disclose the communication signal between base station and the mobile station is a time division duplex signal.

Juntti, on the other hand, discloses TDD communication between a base station and a mobile station in a CDMA communication system (see col. 3 lines 51-62).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was mad to includes the teaching of Juntti in the system taught by Wheatley for TDD signal is equally attenuated in both transmit direction for the same frequency is used in both direction; and the channel changes slightly as a function of time, the duplex time (the period of the transmit/reception time slot) must be sufficiently short, so that the change does not significantly influence the level of the signal, but accurate information about the received signal power level is obtained (see col. 2 lines 57-67 for motivation).

Regarding claim 27, Wheatley discloses each time division duplex communication signal is associated with a code division multiple access data signal (see col. 6 lines 38-48).

Regarding claim 28, Wheatley discloses a data communication system comprising:

a base station having a plurality of spaced apart antennas (see figure 2 and col. 6 lines 18-37);

at least one mobile terminal in communication with the base station (see col. 3 lines 16-20);

and means for providing a distinct delay associated with each antenna of the plurality of spaced apart antennas such that a communication signal coupled between the base station and the plurality of spaced apart antennas can be demodulated within the at least one mobile terminal (the base station comprising of a plurality of delay elements 16A-16(N-1) to provides time diversity between nodes, see figure 2 and col. 6 lines 49-51).

Wheatley fails to disclose the communication signal between base station and the mobile station is a time division duplex signal.

Juntti, on the other hand, discloses TDD communication between a base station and a mobile station in a CDMA communication system (see col. 3 lines 51-62).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was mad to includes the teaching of Juntti in the system taught by Wheatley for TDD signal is equally attenuated in both transmit direction for the same frequency is used in both direction; and the channel changes slightly as a function of time, the duplex time (the period of the transmit/reception time slot) must be sufficiently

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short, so that the change does not significantly influence the level of the signal, but accurate information about the received signal power level is obtained (see col. 2 lines 57-67 for motivation).

Regarding claim 34, Wheatley discloses the means for providing a distinct delay is capable of providing a distinct delay associated with each antenna such that a code division multiple access communication signal coupled between the base station and the plurality of spaced apart antennas can be demodulated within the at least one mobile terminal (see col. 6 lines 38-48).

Regarding claim 54, Wheatley discloses a data communication system comprising:

a base station having a plurality of spaced apart antennas (see figure 2 and col. 6 lines 18-37);

at least one mobile terminal in communication with the base station (see col. 3 lines 16-20);

and means for providing a distinct delay associated with each antenna of the plurality of spaced apart antennas such that a communication signal coupled between the base station and the plurality of spaced apart antennas can be demodulated within the at least one mobile terminal (the base station comprising of a plurality of delay elements 16A-16(N-1) to provides time diversity between nodes, see figure 2 and col. 6 lines 49-51).

Wheatley fails to disclose the communication signal between base station and the mobile station is a time division duplex signal.

Juntti, on the other hand, discloses TDD communication between a base station and a mobile station in a CDMA communication system (see col. 3 lines 51-62).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to include the teaching of Juntti in the system taught by Wheatley for TDD signal is equally attenuated in both transmit direction for the same frequency is used in both direction; and the channel changes slightly as a function of time, the duplex time (the period of the transmit/reception time slot) must be sufficiently short, so that the change does not significantly influence the level of the signal, but accurate information about the received signal power level is obtained (see col. 2 lines 57-67 for motivation).

Regarding claim 62, Wheatley discloses the means for providing a distinct delay is capable of providing a distinct delay associated with each antenna such that a code division multiple access communication signal coupled between the base station and the plurality of spaced apart antennas can be demodulated within the at least one mobile terminal (see col. 6 lines 38-48).

Claims 7-11, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wheatley-Akerberg as applied to claims 1 or 39 above, and further in view of Jung et al. (US 6,307,851), hereinafter Jung.

Regarding claims 7-11, the combination of Wheatley-Akerberg fail to disclose the terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability.

Jung, on the other hand, discloses the receiving terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability (see col. 13 lines 63 to col. 14 line 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to provided the teaching of Jung in the system taught by the combination of Wheatley-Akerberg for coherent receiver to compensate for transmission-channel impairments such as frequency-dependant phase and amplitude distortion.

Regarding claims 40-45, the combination of Wheatley-Akerberg fail to disclose the terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability.

Jung, on the other hand, discloses the receiving terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability (see col. 13 lines 63 to col. 14 line 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to provided the teaching of Jung in the system taught by the combination of Wheatley-Akerberg for coherent receiver to compensate for transmission-channel impairments such as frequency-dependant phase and amplitude distortion.

Claims 22-26, 29-33, and 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Wheatley-Juntti as applied to claims 21 or 28 or 54 above, and further in view of Jung.

Regarding claims 22-26, the combination of Wheatley-Juntti fail to disclose the terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability.

Jung, on the other hand, discloses the receiving terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability (see col. 13 lines 63 to col. 14 line 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to provided the teaching of Jung in the system taught by the combination of Wheatley-Juntti for coherent receiver to compensate for transmission-channel impairments such as frequency-dependant phase and amplitude distortion.

Regarding claims 29-33, the combination of Wheatley-Juntti fail to disclose the terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability.

Jung, on the other hand, discloses the receiving terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability (see col. 13 lines 63 to col. 14 line 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to provided the teaching of Jung in the system taught by the combination of Wheatley-Juntti for coherent receiver to compensate for transmission-channel impairments such as frequency-dependant phase and amplitude distortion.

Regarding claims 55-59, the combination of Wheatley-Juntti fail to disclose the terminal comprises a joint detector; or a zero-forcing block linear equalizer having

decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability.

Jung, on the other hand, discloses the receiving terminal comprises a joint detector; or a zero-forcing block linear equalizer having decision feedback capability; or a minimum-mean-square error equalizer having decision feedback capability (see col. 13 lines 63 to col. 14 line 31).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention was made to provided the teaching of Jung in the system taught by the combination of Wheatley-Juntti for coherent receiver to compensate for transmission-channel impairments such as frequency-dependant phase and amplitude distortion.

Allowable Subject Matter

Claims 6, 60-61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 13-20, 46-53 are allowed.

Conclusion

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry)

Or:

Hand-delivered responses should be brought to Crystal Park II, 2021

Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Bob A. Phunkulh** whose telephone number is **(703) 308-8251**. The examiner can normally be reached on Monday-Friday from 8:00 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor **Douglas W. Olms**, can be reach on **(703) 305-4703**. The fax phone number for this group is **(703) 872-9314**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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TC 2600

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August 23, 2004

BOB PHUNKULH
PRIMARY EXAMINER